

AMENDMENT

Please replace all prior versions and listings of claims with the following listing of claims.

LISTING OF CLAIMS:

1. (Currently Amended) A mobile system responsive to a user generated natural language speech utterance, comprising:

a speech unit configured to receive ~~that receives~~ a natural language speech utterance from a user and convert ~~encodes~~ the received natural language speech utterance into an electronic signal; and

a natural language speech processing system configured to receive ~~that receives~~, process ~~processes~~, and respond ~~responds~~ to the electronic signal ~~encoded natural language speech utterance~~ using data received from a plurality of domain agents, wherein the natural language speech processing system includes:

a speech recognition engine configured to recognize ~~that recognizes~~ at least one of words or phrases ~~[[in]]~~ from the electronic signal ~~encoded natural language speech utterance~~ using at least the data received from the plurality of domain agents, wherein the data used by the speech recognition engine is dynamically updated based on at least a history of one or more prior dialogs associated with the user;

a parser configured to interpret ~~that interprets~~ the recognized words or phrases, wherein the parser uses at least using the data received from the plurality of domain agents to interpret the recognized words or phrases, wherein the parser is configured to interpret ~~interprets~~ the recognized words or phrases by:

determining a context for the natural language speech utterance;

selecting at least one of the plurality of domain agents based on the determined context; and

transforming the recognized words or phrases into at least one of a question or a command, wherein the at least one question or command is

formulated in a grammar that the selected domain agent uses to process the formulated question or command; and

an agent architecture that configured to communicatively couples couple services of each of an agent manager, a system agent, the plurality of domain agents, and an agent library, wherein the selected domain agent is configured to use uses the communicatively coupled services to create a response to the formulated question or command and format the response for presentation to the user.

2. (Currently Amended) The mobile system according to claim 1, wherein the natural language speech processing system further includes an event manager configured to send that sends and receives receive events to components of the natural language speech processing system to coordinate interaction among the components of the natural language speech processing system, wherein the event manager includes a multi-threaded environment configured to enable the natural language speech processing system to provide real-time responses to a plurality of questions or commands across a plurality of user sessions.

3. (Cancelled)

4. (Currently Amended) The mobile system according to claim 1, wherein the response includes a text string and the natural language speech processing system further includes a text to speech engine configured to create that creates an encoded speech message to be annunciated to the user.

5. (Cancelled)

6. (Previously Presented) The mobile system according to claim 1, wherein the selected domain agent includes data associated with at least one of driving directions, travel information, restaurant information, vehicle systems information, safety information, or entertainment information.

7. (Previously Presented) The mobile system according to claim 1, wherein the selected domain agent includes data for communicating with one or more devices.
8. (Previously Presented) The mobile system according to claim 7, wherein the data for communicating with the one or more devices includes data for controlling the one or more devices.
9. (Cancelled)
10. (Previously Presented) The mobile system according to claim 1, wherein at least one of the one or more devices is associated with a vehicle.
11. (Previously Presented) The mobile system according to claim 10, wherein at least one of the speech unit or the natural language speech processing system is located remotely from the vehicle.
12. (Previously Presented) The mobile system according to claim 10, wherein the device associated with the vehicle is at least one of a navigation system, a vehicle monitoring system, a security system, a vehicle control system, or a vehicle media system.
13. (Previously Presented) The mobile system according to claim 1, wherein the communicatively coupled services include at least one remotely located service and the selected domain agent includes data for controlling or communicating with the remotely located service.
14. (Previously Presented) The mobile system according to claim 13, wherein the remotely located service includes at least one of a payment service provider, a customer relationship management system, a specialized service, a location service, or an emergency service.

15. (Currently Amended) The mobile system according to claim 13, wherein the speech unit and the natural language speech processing system each include respective transceivers that configured to communicate via a communication network.
16. (Original) The mobile system according to claim 15, wherein the communication network is a wide area wireless network.
17. (Previously Presented) The mobile system according to claim 15, wherein the transceiver is a wide-area RF transceiver.
18. (Currently Amended) The mobile system according to claim 1, wherein the speech unit includes a speech coder configured to convert that encodes the natural language speech utterance into the electronic signal, an array microphone configured to receive that receives the natural language speech utterance, and a filter configured to optimize that optimizes a signal to noise ratio of the encoded natural language speech utterance electronic signal.
19. (Currently Amended) The mobile system according to claim 18, wherein the filter is configured to employ employs adaptive echo cancellation to optimize the signal to noise ratio of the electronic signal.
20. (Original) The mobile system according to claim 18, wherein the array microphone is at least a one-dimensional array.
21. (Currently Amended) The mobile system according to claim 18, wherein the speech coder is configure to use uses an adaptive lossy audio compression to convert the natural language utterance into the electronic signal.

22. (Previously Presented) The mobile system according to claim 1, wherein the speech unit is located remotely from the natural language speech processing system.

23. (Previously Presented) The mobile system according to claim 1, further comprising at least one of a display or a keypad.

24. (Currently Amended) The mobile system according to claim 1, further comprising a telematics control unit configured to interface that interfaces with one or more devices on a vehicle.

25. (Previously Presented) The mobile system according to claim 24, wherein at least one of the speech unit or the natural language speech processing system is embedded in the telematics control unit.

26. (Previously Presented) The mobile system according to claim 1; wherein at least one of the speech unit or the natural language speech processing system is embedded in at least one of a vehicle, a handheld device, a fixed computer, or a mobile computer device.

27. (Currently Amended) The mobile system according to claim 1, wherein the communicatively coupled services include at least one ~~the~~ shared network resource.

28. (Currently Amended) A method responsive to a user generated natural language speech utterance, comprising:
receiving, at a speech unit, a natural language speech utterance from a user, wherein the speech unit is configured to convert encodes the received natural language speech utterance into an electronic signal;
recognizing, at a speech recognition engine, at least one of words or phrases [[in]] from the electronic signal encoded natural language speech utterance, wherein the speech recognition engine is configured to use at least uses data received from a plurality of domain

agents to recognize the words or phrases, wherein the data used by the speech recognition engine is dynamically updated based on at least a history of one or more prior dialogs associated with the user;

determining, at a parser, a context for the natural language speech utterance;

selecting, at the parser, at least one of the plurality of domain agents based on the determined context;

transforming, at the parser, the recognized words or phrases into at least one of a question or a command, wherein the at least one question or command is formulated in a grammar that the selected domain agent uses to process the formulated question or command; and

forwarding the formulated question or command to an agent architecture, wherein the agent architecture is configured to communicatively couple communicatively coupling services of each of an agent manager, a system agent, the plurality of domain agents, and an agent library, wherein the selected domain agent is configured to use uses the communicatively coupled services to create a response to the formulated question or command and format the response for presentation to the user.

29. (Currently Amended) The method according to claim 28, wherein the speech unit includes an array microphone configured to receive that receives the natural language speech utterance, a speech coder configured to convert that encodes the natural language speech utterance into the electronic signal, and a filter configured to optimize that optimizes a signal to noise ratio of the encoded natural language speech utterance electronic signal.

30. (Previously Presented) The method according to claim 28, the wherein the selected domain agent includes data for controlling or communicating with at least one of a navigation system, a vehicle monitoring system, a security system, a vehicle control system, or a vehicle media system.

31. (Previously Presented) The method according to claim 28, wherein the selected domain agent includes data associated with at least one of driving directions, travel information, restaurant information, vehicle systems information, safety information, or entertainment information.
32. (Previously Presented) The method according to claim 28, wherein the communicatively coupled services include at least one remotely located service and the selected domain agent includes data for controlling or communicating with the remotely located service.
33. (Previously Presented) The method according to claim 32, wherein forwarding the formulated question or command to the agent architecture includes transmitting a request to the remotely located service.
34. (Previously Presented) The method according to claim 33, wherein the remotely located service is associated with a remotely located device.
35. (Previously Presented) The method according to claim 33, wherein the request is transmitted to the remotely located service via a communication network.
36. (Previously Presented) The method according to claim 32, wherein the remotely located service includes at least one of a payment service provider, a customer relationship management system, a specialized service, a location service, or an emergency service.
37. (Previously Presented) The method according to 33, wherein the request is transmitted to the remotely located service via a wide-area RF transceiver.

38. (Currently Amended) The method according to 29, wherein the filter is configured to remove removes background noise from the electronic signal to optimize the signal to noise ratio of the encoded natural language speech utterance electronic signal.

39. (Currently Amended) The method according to 29, wherein the filter is configured to employ employs at least one of adaptive echo cancellation or adaptive lossy audio compression to optimize the signal to noise ratio of the encoded natural language speech utterance electronic signal.

40. (Cancelled)

41. (Previously Presented) The method according to claim 28, wherein the communicatively coupled services include one or more shared network resources.

42. (Previously Presented) The method according to claim 41, wherein the shared network resources include a telematics control unit that interfaces with one or more devices on a vehicle.

43. (Previously Presented) The method according to claim 42, wherein the shared network resources further include at least one resource located remotely from the vehicle.

44-56. (Cancelled)

57. (New) The mobile system according to claim 1, wherein the agent manager is configured to:

load and initialize the system agent and the plurality of domain agents when the natural language speech processing system boots-up;

unload the system agent and the plurality of domain agents when the natural language speech processing system shuts-down;

perform license management for the plurality of domain agents and content stored in one or more databases; and

search a network to find a source for a suitable agent if the question or command requires an agent not currently loaded on the natural language speech processing system.

58. (New) The mobile system according to claim 1, wherein the agent library includes one or more utilities for commonly used functions in the natural language speech processing system, wherein the commonly used functions include at least one of text and string handling, network communications, database lookup and management, fuzzy and probabilistic evaluation, or text to speech formatting.

59. (New) The mobile system according to claim 58, wherein the system agent is configured to:

provide default functionality and foundation services that can be used by each of the plurality of domain agents;

use the utilities of the agent library for the commonly used functions; and

manage one or more criteria handlers used to determine the context for the natural language speech utterance, wherein the one or more criteria handlers provide context sensitive procedures for extracting information from the at least one question or command.

60. (New) The mobile system according to claim 1, wherein the speech recognition engine is configured to:

determine an identity of the user based on unique voice characteristics of the user; and

tag the recognized words or phrases with the identity of the user to associate the utterance with the user and a dialog in the natural language speech processing system.

61. (New) The mobile system according to claim 1, wherein the data used by the speech recognition engine is dynamically updated based on one or more dynamic fuzzy set possibilities or prior probabilities.

62. (New) The mobile system according to claim 2, wherein the multi-threaded environment of the event manager is configured to further enable the natural language speech processing system to provide real-time responses to the plurality of questions or commands using a plurality of the domain agents.